ABSTRACT

Systems and methods are provided for compensating for variations in line voltages the power an electro-kinetic air transporter and conditioner device. The electro-kinetic air transporter and conditioner device includes a high voltage generator that provides a potential difference between at least one emitter electrode and at least one collector electrode. The high voltage generator is driven by both a DC voltage obtained from an AC voltage source, and a low voltage pulse signal. The DC voltage is stepped down to produce a voltage sense signal indicative of a level of AC voltage source. The voltage sense signal is monitored. At least one of a pulse width, duty cycle and frequency of the low voltage pulse signal is adjusted, based on the monitored voltage sense signal, in order to substantially maintain the potential difference at a desired level.